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Materiel Test Procedure 2-2-707*
Aberdeen Proving Ground

U. S. ARMY TEST AND EVALUATION COMMAND
COMMON ENGINEERING TEST PROCEDURE

KITS (VEHICLE)

1. OBJECTIVE

The purpose of this document is to instruct personnel in the techniques of testing automotive accessory kits.

2. BACKGROUND

A kit, by definition is an adjunct which, while extending the capability of the equipment, should not detract from its normal functions. (Added weight and dimensional changes such as may be found in flotation kits may be expected if only a reasonable degradation is caused; a kit such as a flame thrower will necessarily affect the fighting characteristics of a tank.) In addition, kits should be removable without detracting from the serviceability of the original equipment.

Kits, in the sense used herein, are accessories which may be attached to vehicles to give them some capability beyond that of the original design. Such a capability may be required on all vehicles involved in a specific military operation, or for permanent use with selected vehicles. All vehicles in a division, for example, might need to be equipped with fording kits if river crossings are anticipated in the course of a campaign. On the other hand, machine gun mounts may be required only on every fourth amphibious truck; tank dozers may be distributed one to a company; and truck-mounted A-frames could be allotted two to a company. In all cases, the kit may be mounted or dismounted without major changes in the vehicle.

Vehicular kits could conceivably be used to facilitate the performance of any function or operation by or in a vehicle. Kits most commonly given a full proving ground test include bulldozers; fording, floating, and swimming equipment; machine gun mounts; traction devices; A-frames; winterization equipment; and winches. Specialized kits are given endurance tests as installed; falling in this category are radios, flame throwers, collective protective devices, infrared equipment, armor appliques, litter, and other specific items.

3. REQUIRED EQUIPMENT

None.

4. REFERENCES

A. MTP 2-2-506 Durability Testing of Wheeled Vehicles

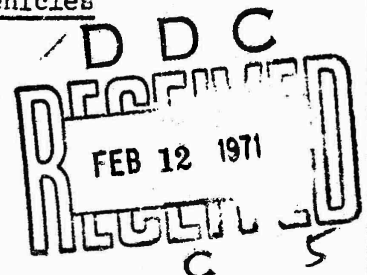
*Supersedes Ordnance Proof Manual 60-146

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- B. MTP 2-2-507 Durability Testing of Tracked Vehicles
- C. MTP 2-2-508 Safety Evaluation (Automotive)
- D. MTP 2-2-526 Secondary Armament
- E. MTP 2-2-612 Fording & Immersion
- F. MTP 2-2-650 Cold Starting & Warm-Up
- G. MTP 2-2-706 Traction Devices
- H. MTP 2-2-708 Personnel Heating Systems

5. SCOPE

5.1 SUMMARY

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This pamphlet discusses the testing of accessory kits with regard to case of installation and maintenance, compatibility, performance, and endurance. In addition, the most commonly tested specific kits are also cited.

Although not discussed herein, the safety aspects as set forth in MTP 2-2-508 shall also be taken into consideration in evaluating each kit.

5.2 LIMITATIONS

This MTP does not consider vehicle modification kits, which are employed to correct a deficiency existing in a given model. Such kits are typically issued on a modification work order (MWO), after appropriate testing, as a product correction.

6. PROCEDURE

6.1 PREPARATION FOR TEST

The equipment shall be installed in accordance with the instructions furnished, usually with standard tools. Accurate records shall be kept of the man hours required, as well as any need for special tools or jigs. When instructions themselves are imperfect, this fact shall also be noted.

6.2 TEST CONDUCT

Performance tests shall be appropriate to the equipment and, in some cases, may be the same as those established by other MTP sections, e.g., 2-2-612, 2-2-712, 2-2-650. In most cases, the specifications will establish minimum standards for such features as capacity and speed for winches or minimum temperatures for cold starts with the use of starting aids. Basically, the objective of the test shall be to determine if the kit does the job for which it was designed and is compatible with the vehicle to which it is attached.

6.2.1 Endurance

The endurance of accessory equipment should be commensurate with that of the basic vehicle, but it is not necessarily expected to be in full time use. It is not anticipated, for example, that a bulldozer or generator kit will have the durability (in operating time) of the basic vehicle which, in the case of a tank, would be 6,000 miles. The endurance quality shall be measured in terms of hours of service (MTP 2-2-507).

6.2.2 Specific Kits

Only the more commonly tested specific kits are discussed below. The variety of the potential subjects is limited only by the range in possible functions. In addition to the kit characteristics listed, the applicable sections of MTP 2-2-508, Safety Evaluation (Automotive), shall be checked.

6.2.2.1 Machine Gun Mounts

As kits, machine gun mounts are normally either ring or pedestal types. Performance tests shall be carried out in accordance with MTP 2-2-526. Endurance mileage shall be accumulated with the gun and a full load of ammunition in place, the distances being as specified by MTP 2-2-506 and MTP 2-2-507. The holding ability of travel locks shall be observed under cross-country conditions, and the functioning of the mount shall be checked during operation in mud and dust.

6.2.2.2 Bulldozers

Bulldozers are used as kits for tank-type vehicles and shall be evaluated as described in paragraphs 6.1 through 6.2.1. Functional and endurance testing shall be combined as specified in MTP 2-2-507, which also specifies operation cross-country with the blade in travel position to test the durability of hydraulic components.

6.2.2.3 Fording Kits

Testing of fording kits shall be as specified in MTP 2-2-612. Figure 1 shows a truck fitted with a fording kit being tested.

6.2.2.4 Traction Devices

Traction devices shall be tested as specified in MTP 2-2-706.

6.2.2.5 Climatic Environmental Equipment

Winterization kits, special starting aids, and other starting accessories shall be tested as provided in MTP's 2-2-650 and 2-2-708. Winterization kits shall be thoroughly checked out under cold room conditions before field tests are performed.

6.3 TEST DATA

6.3.1 Machine Gun Mounts

- a. Data for performance is to be recorded and collected as described in MTP 2-2-526.
- b. Record endurance mileage:
 - 1) For wheeled vehicles use MTP 2-2-506.
 - 2) For tracked vehicles use MTP 2-2-507.
- c. Evaluate crew safety per applicable portion of MTP 2-2-508.
- d. Evaluate holding ability of travel locks.
- e. Evaluate functioning of mount, during operation, in mud and dust.



Figure 1. Quarter Ton 4 by 4 Truck Fitted with Deep Water Fording Kit
Operating through Water Bath

6.3.2 Bulldozers

- a. Functional and endurance data shall be recorded and collected as described in MTP 2-2-507.
- b. Evaluate safety per applicable portion of MTP 2-2-508.

6.3.3 Fording Kits

- a. Data shall be recorded and collected as described in MTP 2-2-612.
- b. Evaluate safety per applicable portion of MTP 2-2-508.

6.3.4 Traction Devices

- a. Data shall be recorded and collected as described in MTP 2-2-706.
- b. Evaluate safety per applicable portion of MTP 2-2-508.

6.3.5 Climatic Environmental Equipment

- a. Data shall be recorded and collected as described in:
 - 1) MTP 2-2-650
 - 2) MTP 2-2-708
- b. Evaluate safety per applicable portion of MTP 2-2-508.

6.4 DATA REDUCTION AND PRESENTATION

Tests of kits are usually performed as separate projects, but may be part of a vehicle project. In either case, evaluation shall be based upon the areas outlined in paragraph 6.2; ease of installation, compatibility, performance, endurance and safety.